The Optical Magic Lantern Journal and Photographic Enlarger

Edited by J. Hay Taylor.

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NOTICES.

THE *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price Two Pence, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

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NOTES.

A Happy New Year to All

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Index for 1899.—With this number we issue the index for the past year. Those who keep the parts each month and bind them at the end of the year can, as usual, get binding cases from our publishers post free for 1s. 1½d. Bound volumes for 1899 are now ready, price 3s., postage 4d. extra.

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Cinematograph Fire.—One should always be careful to have cinematograph film automatically wound up as it passes through the machine. The film when thus tightly wound is very difficult to ignite even if held in a flame for a short time, whereas if it is loosely coiled up it will readily blaze. During a Primrose League meeting at Farnborough on the 7th ult., by some means or other the film used with the lantern ignited and the lantern became ablaze. A panic ensued, people got knocked down, and windows had to be broken in order to allow of a speedy egress.

Change of Address.—We note that Mr. Philipp Wolff, the well-known dealer in cinematographic pictures, has removed from Southampton Street, Holborn, to 46, Strand, W.C.

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Calcium Carbide Explosion.—On November 6th occurred an explosion of a calcium carbide furnace in the Dominion Carbide Gas Works near Ottawa. There was a fire in the neighbourhood at the time, and the water flowed down into the carbide furnace. As a result the whole furnace blew up, injuring 15 men. The carbide flew in chunks about the size of a man's fist, but one mass of carbide weighing a thousand pounds was blown through one of the factory doors. Eye witnesses of the catastrophe state that as the explosion occurred the building was filled with flames as well as smoke and the fumes of the carbide, and the people were almost overpowered. The fumes were so strong that the whole vicinity of the factory smelled strongly of the gas. According to the *Railway Review*, the force of the explosion was felt all over the vicinity.

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"The Absent-Minded Beggar" Slides.—A set of nine slides to illustrate Mr. Rudyard Kipling's poem, "The Absent-Minded Beggar," has been introduced by Riley Brothers, Limited, of Bradford.

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Acetylene Installation.—A town (Tata-Tovaros) in Hungary, of 12,000 inhabitants, has adopted acetylene for illuminating purposes. The generating plant is contained in a building 26 feet by 13 feet, and consists of practically two plants which can be used either alternately or together. Gas which is generated by carbide falling into the water passes through a coiled cooler and a chemical purifier, and into two gasometers, thence through drying cylinders into a pressure regulator and into the main for distribution. There are about 5 miles of piping, 160 street lamps, and about 300 house burners. The whole plant and piping, which cost about £3,500, only requires the services of two men to keep it in operation.

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Kodak.—Kodak (Limited) announce a dividend of 1½ per cent. on the Preference issue, making 6 per cent. for the year ending the 31st ult., and an interim payment of 2½ per cent. on the Ordinary shares, both payable on and after January 1st.

A Lanternist's Creed.

THE Rev. C. H. Woolston, of the East Baptist Church, Philadelphia, U.S.A., has formulated the following lantern Creed, after 13 years of illustrated work.

He states:—

I BELIEVE:

1. In the sacred use of the Lantern.
2. The Lantern has come to stay.
3. An ounce of picture is worth a ton of talk.
4. Sound often goes in one ear and out the other, but a picture never goes in one eye and out the other.
5. Solomon said: "The hearing ear and seeing eye, the Lord hath made even both of them."—Prov. xx., 12.
   I believe in using them both, and the Lantern is my agent.
6. The Old Testament "Rainbow" was a picture on the sky—the first Lantern slide.
7. That when Abraham was shown the stars, and told to count them, that the Lord was reaching his heart by the eye gate and ear gate combined—this is all the Lantern will do. It was good enough for Abraham, it is good enough for me.
8. That on the third day the Lord came down in sight of all the people upon Mt. Sinai—It was a picture of light and fire—and the Lantern makes shining the truth—"in sight of all the people."
9. It brings the children to church, and they understand the truth.
10. It helps the believer; catches the eye and heart of the unsaved.
11. It is God's work in God's way. Come and see.

C. H. WOOLSTON.

Every Sunday evening lantern services are held here, and on other evenings concerts and lectures are given in a special lecture room adjoining the church. The former has seating capacity for 500, and the latter, which is a handsome building, contains 946 assembly chairs, and is illuminated by 169 electric lamps.

The following invitation, which is sent out by this church, may perhaps appear a little odd to people in England:—

"If your Church is closed, come with us.
"We would like to
"C.U.B.A.
"Member of the congregation."

Ripple on Waves.

By H. W.

SOME passages in one of the recent numbers of the OPTICAL MAGIC LANTERN JOURNAL remind me of a peculiar way in which a sunrise set of dissolving views was painted for me in London some months ago—and I venture to hope that my remarks may not be without utility for slide painters, who seem too often to execute their work in a very mechanical routine and unreflecting fashion.

The set in question professes to depict sunrise at sea. To say nothing of the clouds which are absurdly unnatural, the sun rises, not in the centre of the view—the position surely the best in such a picture where the rising luminary must be the main object of the spectator's attraction, and that in which Turner places his setting suns—but at one side. Worse than this, however, the ripple of light on the waves is made to lie in a path perpendicular to the horizon, a direction it can follow only

when it is central.

This of course is a glaring blunder, while the position chosen for sun or moon in such a view, it may be contended, is merely a question of taste or judgment. Gross, however, as this blunder is, it is far too frequent in "effect slides" for the magic lantern.

Whatever the position of the sun or moon or other luminaries in the picture, the ripple caused by the reflection on the waves *must* follow a line towards the position of the spectator, which is of course always equidistant from either side limit of the picture, *i.e.*, central, although usually below the base.

To prove this optically and mathematically would not be difficult but would probably take up too much space. In a question of art—go to Nature at once. If these slide painters who give us such false optics in their pictures will take a walk any night by the Thames, a harbour, or any other water when it is ever so slightly agitated, and when the moon is shining, or the reflection of lamps is visible, they need only the commonest observation to convince them that all the paths of light reflected from the lamps, etc., converge towards the point at which the observer is situated. They should accordingly in a picture be made to follow paths which would meet at that point, for only *that* path of light can be perpendicular to the horizon which proceeds from a centrally placed luminary.

Cycling and Lanternising.

By ALBERT TRANTER.

THERE is a great deal of truth in the old saying that all work and no play makes Jack a dull boy, and for that reason the indulgence in such pleasures as cycling and lanternising will always have the effect of making the devotees of such pastimes or hobbies realise that there is something in this world to make them happy, and that by such indulgence they can give pleasure to other people as well, and my idea in writing this is to suggest that those who combine the pleasures of cycling and photography should think, on setting out on a tour, whether there is any place or object on the route which, when photographed, would be of interest to the literary brethren of the optical lantern. I am sure there are many places in different parts of the British Isles which would pay for being photographed and supplied as lantern slides to students of English literature. Such subjects could be exchanged or sold, and in the latter case they ought to be supplied at the rate of not more than 6s. a dozen, and not 12s. per dozen, as some dealers ask for plain slides. The use of a good camera for this work, fitted with a Zeiss or Goerz lens, would be desirable, but not one that is too heavy. I venture to think that many a pleasant Saturday afternoon could be spent in this way, provided the cyclist did not object to the slight extra weight to be carried on his machine.

* * *

How Cinematographic Machines work.—No. X.

By MAGNET.

MANY interesting points in the construction of cinematographs are embodied in the invention of Stafford-Noble and Liddle. These consist mainly in the feeding of the film forward and perforating. Their methods of accomplishing this will be easily understood by the accompanying views of their machine, Fig. XXIV. being a side elevation, and Fig. XXV. a front elevation.

Upon a base A are mounted two side frames BB with cross bars B′, adapted to carry the mechanism. Above the frames BB is arranged the spindle C, carried in the blocks D with adjusting screws E, attached to rods F sliding in standards G, fixed to side frames BB and provided with adjusting screws H. By this means the height of spindle C may be adjusted to accommodate the spools of film of varying diameter. Upon one end of the spindle C and rotating freely thereon is placed the spool of film J, which is to be passed through the machine.

The film K passes from the spool J downwards through the gate L, which consists of a rectangular metal frame lined with plush; the gate closing over the film K in such a manner as to offer a slight frictional resistance to the downward motion of the film.

Behind the gate is arranged the shutter O, consisting of a short metal tube with one end closed and attached to the spindle P carried in bearings in side frames BB. Openings are formed in the tube so as to retain preferably two equal segments opposite to one another. On rotating the shutter at a suitable speed the segments will intercept the passage of light through the apparatus for a short period, and twice during each revolution of said shutter. After leaving the gate the film, proceeding downwards, passes partly round the looping roller Q, carried by the rocking arms R, which are mounted and move freely on the same spindle Z that carries the drum X. The rocking arms R are actuated by the crank disc S, crank pin T, and connecting link U. The crank disc S is attached to spindle V, revolving in bearings in frame W and side frame B, to which the frame W is attached. From the looping roller Q the film passes partly round the drum X, and is provided with small holes Y spaced at equal intervals around circumferential lines on its periphery. The drum X is attached to spindle Z carried in bearings in side frames B and frame W. The film is held in contact with the drum X by means of a roller I driven by drum X, and provided with pins to work in the holes Y of the drum X and engage with the perforations in the film.

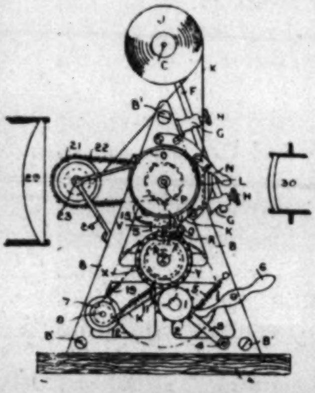


Fig. XXIV.

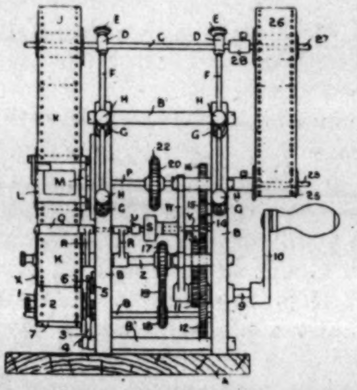


Fig. XXV.

The apparatus may be used for perforating films, as any unperforated film which is passed between drum X and roller I when they are revolving will be immediately perforated.

To perforate films, another roller is employed with projections specially made for the purpose, the said roller being arranged to take the place of roller I.

The roller I is mounted on the swinging arm 3, pivoted at 4, and kept against the drum X and film by a spring 5. A catch 6 is provided, which throws the roller I in and out of gear with the drum X.

After leaving the roller I the film passes to a bobbin 7 which slides on and rotates with the spindle 8.

Motion is imparted to the apparatus through the driving spindle 9, revolving in bearings in side frame B and frame W. To this spindle 9 is attached the crank handle 10 and the toothed wheels 11 and 12. Wheel 11 drives toothed wheel 13, attached to drum spindle Z, and wheel 12 drives the train of toothed wheels 14, 15 and 16.

Wheel 14 is attached to crank disc spindle V.

Wheel 15 is an idle wheel connecting wheels 14 and 16.

Wheel 16 is attached to shutter spindle P.

On the drum spindle Z is fixed the groove pulley 17, driving the grooved pulley 18 by means of a suitable continuous spiral spring 19, stretched over both pulleys.

The grooved pulley 18 is attached to the spool core spindle 8.

On the shutter spindle P is fixed a grooved pulley 20 driving the grooved pulley 21 by means of a continuous spiral spring 22 stretched out over both pulleys.

The grooved pulley 21 is attached to a spindle 23 carried in brackets 24 fixed to side frames BA, spool core 25 slides on and rotates with spindle 23.

The spool of film 26 to be rewound slides on and rotates on the spindle 27, which is attached to the spindle C by means of the sleeve 28, and the rewinding is effected as hereinafter described.

The spool of film J is placed on spindle C, and passed through the apparatus to the spool core 7.

On turning the handle 10 the various toothed wheels and spindles on which they are fixed revolve.

The drum X revolving causes the roller I to revolve, the projections 2 on which engage with perforations in the film and so draw the film through the apparatus to the spool core 7 where it is wound up. At the same time the looping roller Q is being moved backwards and forwards, the effect of which is the drum X and roller I continuously revolving is firstly to form a loop in the film with the result that the required portion of film is drawn through the gate L from the spool J; secondly, on the return movement of said looping roller Q that portion of film which formed the loop is drawn through by drum X and roller I without moving the film in the gate or unwinding from spool J.

The shutter O, continuously revolving, is so arranged that when the film is stationary in the gate the openings in said shutter are opposite the gate and permit the passage of light through the apparatus, whilst when the film is moving the segments in shutters are opposite gate and so intercept the light.

The various parts driving the looping roller are so proportioned as to always keep said looping roller in contact with the film, and the looping roller being also mounted on the same spindle as the drum X, its distance from periphery of said drum will be constant. It will therefore be seen that the strain upon the film while passing through the apparatus will be normal, unevenness will be rendered impossible, and the danger of tearing the film reduced to a minimum.

When a film is to be rewound, the spool 26 is placed on spindle 27, and the core 25 on spindle 23. The rewinding may however be done whilst another film is passing through the other side of the apparatus.—14861 of 1897.

Lantern Screens, Sheets, and Frames.

By THOS. J. SMITH.

THE words "screen" and "sheet" being often used indiscriminately, perhaps it will clear the air to state what is known technically as one, and the other. A screen is made of some material which ought not to let any light pass through, and is fixed window blind fashion on a batten and roller; the latter being usually heavier, should be at the bottom. A sheet is, or ought to be, made of closely woven linen or calico (which is to be had up to 9 feet wide), stitched together to form the required size and hemmed and bound with tape all round. A frame is made of wood or bamboo in suitable lengths, rather larger when put together than the sheet, which is then stretched on it till not a crease or wrinkle is visible. The screen is the best, but awkward for travelling. The sheet and frame being portable are the best substitute. All screens should be recoated each autumn with a wash of pure Chinese white, or else whiting mixed with some size and a little blue, the latter being cheap as well as good. Sheets if soiled in the creases or otherwise rather dirty should be washed. They will let more light through than before, but are far preferable to a dirty or marked sheet which the greater light only shows up the more. A good sheet with care will be passably clean for two winters, and all who value the best results would do well to sell their soiled one, when washed, for a fair sum and get a new one. The difference in cost will repay itself in much finer results. Doubtless to some the use of a frame will seem unnecessary, but the difference between pictures on a tight sheet and a hanging one is very great indeed. This will be apparent from the fact that a perfectly white, smooth, opaque surface, free from cracks, creases, streaks or other marks, is

absolutely the best

for lantern work. Supposing then that some readers are already after something better than they have hitherto put up with—and it is astonishing what some lanternists, and still more some audiences will put up with—the question should be asked: What kind of article will best serve our purposes? for in this connection it is a fact that the same sum will procure the most suitable, or in some cases absolutely the most unsuitable article, and yet in each case the buyer may have intrinsically full value for the money paid.

Firstly, if the displays are in one building, a roller screen is by far the best for convenience, appearance and results. For use at home or in small rooms, a very good and cheap one is of white cartridge paper, that obtainable at artists' repositories, 5 feet wide. This with a lath top and roller bottom, mounted like a map, or even two pieces of suitable picture framing, is excellent. Then there are the reversible cloth ones, of a kind of slate colour on one side for a background in photography, and with a white surface on the other side for use with the lantern. Coming to larger sizes, if economy must be strictly considered, stout sheeting, well sewn and well hung on roller and batten, with two or three coats of proper whitewash will make a fairly good article but not light-proof. The correct article is made of suitable canvas with a prepared surface so that practically no light gets past the whitened surface, and this means greater brilliancy in the pictures, and with proper care, economy in the illuminant. Such an article is best obtained from a reliable dealer, and a half sovereign more laid out at first will often prove to be a real economy in the long run and a greater pleasure in use. For general guidance it may be said that while screens are best fixed where they may remain the year round, still it is not an absolute necessity, and with care, and by hanging it accordingly, any reasonable size may be removed after each display without injury.

The most suitable size of screen for use in one place depends on so many factors, viz., height of hall to ceiling (sometimes very low), length of hall, dimensions of recess, if any, height of platform, etc., that

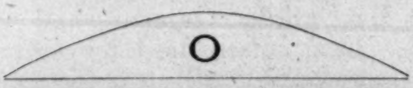
skilled advice

should be sought. It is not always best to erect as big a screen as can be possibly used. Very often a medium-sized picture on a screen filled to the edges, while always looking better, will be found quite big enough for those at the back and give far more pleasure to those at the front, who generally have the worst view and pay most for it.

Secondly, if the displays are not to be confined to one place a sheet is most suitable (or more than one, say two different sizes), though it often repays the care necessary to send a screen safely. The question now arises, what size of sheet or sheets. Those requiring more than one sheet will certainly not need this article to help them, so the one sheet simply may be dealt with. It must be at once noted that practically half the light from the lantern passes through a sheet and is lost as far as illumination of the picture is concerned. It is therefore a good maxim to have a small picture brightly lit than a large one and poor light. To begin with, a 9 feet square sheet, being obtainable in one piece without any seam, is a very good size, and filled to the edges with a full square picture, is by no means to be despised, except in large halls. Coming to a larger size, say a 12 feet picture, this will be found in the great majority of cases to be quite large enough for the great part of the audience to see comfortably. And it must always be borne in mind that the extreme light power of the lantern being developed, would in the one case be covering only 81 square feet, whereas in the other case, the same quantity of light would, so to speak, have to be spread over 144 square feet in a correspondingly thinner layer or coat, the principle being just as if the light were a fixed quantity of paint and had to cover 81 square feet in one case and 144 square feet in the other. Of course, larger sizes are used and needed, up to 20 feet as a regular occurrence. But if purchasers will bear in mind the requirements of their particular case, there need not be much difficulty in deciding upon either a 9 feet or a 12 feet.

Thirdly, in every case far better results are attainable by properly stretching a sheet on all four sides than by merely hanging it in mid-air on a wall. What is more objectionable, after dirt, than a deep crease right across every picture displayed, or a fold, one side or both, throwing part of the picture out of focus? A cheap frame can be made from broom handles with tin ferrules and corner pieces for joining them together, the lengths, of course, being cut so as to suit the frame to the sheet, leaving, say, 3 inches or more from top to bottom and from side to side (measured inside the frame), to allow for stretching of the sheet and slight sagging of the frame. Better and more sightly, of course, is one made of bamboo, each length being plugged with wood at each end, and this made true to fit the brass ferrules (or lacquered tin) closely. A very strong and serviceable one, rather heavier, but able to stand great strain and wear and tear, and one that will not sag in the least if the ends fit the ferrules exactly, can be made of ash or other hard wood, as light as possible, with stout brass ferrules of 18 to 20 gauge and say $1\frac{1}{8}$ in. diameter, and in this case the frame need be made very little larger than the sheet, which should then fit close up to or just hide the poles even, and this makes a really fine appearance, especially when filled as far as possible to the edges with the pictures.

When a sheet is to be thus tightly stretched the frame should be provided with two feet, each like this (side view), slipped on at each bottom corner, and cords from the extremities of each foot to a stout screw-eye in the upright part of frame (say 4 feet from the ground) will enable the whole to be made rigid either in a perpendicular position or slanting forward to allow of the lantern being tilted, and when once made taut the whole erection may be even raised on four chairs quite safely, and thus the picture be clear of the heads of the audience.



IN A RAILWAY CARRIAGE

No. 11.

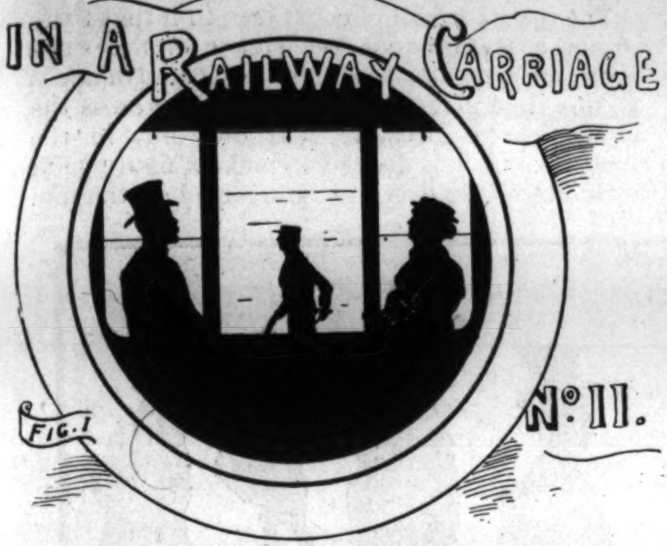


FIG. 1

By **THEODORE BROWN.**

THIS, the 11th slide of the shadowgram series, is an attempt to depict the various scenes that are presented to a person sitting in the far corner of a railway carriage during the time that the train is stopping at a station. Every reader knows what a large number of persons of every kind and description, and of many different nationalities also, are continually passing to and fro at any large station whilst trains are being unloaded and reloaded.

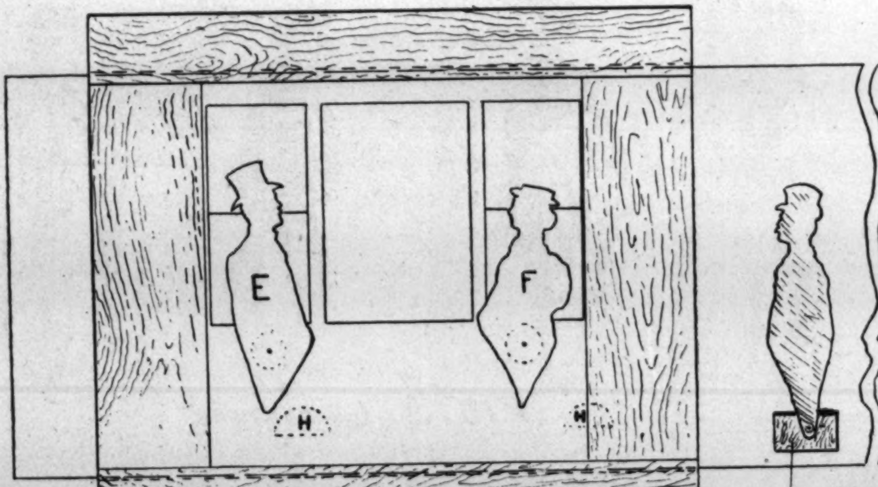


FIG. 2

Here, one sees the city man hurrying along to catch his train, the private gentleman clad in his sporting habiliments, the tramp, with his ragged clothes and hawthorn stick, loitering aimlessly about, the ubiquitous porter wheeling his load of trunks and shouting his everlasting "By your leave!"; and the tiny youngster gazing in awe and fear at the huge iron monster just ready to steam out of the station.

All these one sees, and many more interesting sights, and the slide we are now dealing with is, as before mentioned, an attempt to illustrate in a necessarily simple manner this bustling to and fro.

For the purpose of constructing this slide the usual wooden framework fitted with two glasses, one fixed and the other movable, is employed. On the inner surface of the fixed glass D, Fig. III., is painted in dead black the framework of a railway carriage window, etc., as shown in Fig. I. A few lines are also sketched on the glass to represent the background of the station.

On the same surface of this fixed glass are fastened two small blocks in position shown by dotted lines in Fig. II. One of these blocks is shown at K in the sectional diagram, Fig. III.

Two figures as E and F (Fig. II.) are cut out of tin or any desired material in the shape shown, and pivoted to these blocks by means of two small pins. The position they will occupy when properly fitted is clearly represented in Figs. I. and II.

It is important to notice here that in each figure a small part must be left at the bottom to project over the block as shown.

Now to the inner surface of the movable glass C (Fig. III.), is glued a small block H (Figs. II. and III.). This is glued in such a position that when the sliding glass is slipped along, this block will just touch the projecting ends of the two figures E and F and give them a slight swaying motion. Thus will be imparted the idea of the persons shifting slightly, etc., during the stoppage of the train.

To the exterior surface of the movable glass is fixed another block J (Fig. III.) bearing a small pin which is bent slightly upwards.

A variety of figures as in Figs. IV. and V., are now cut out of any material—cardboard, tin, etc., and a small hole is pierced in the bottom of each.

These figures are hung one by one on the pin fastened in the block J, and the sliding glass then moved slowly along.

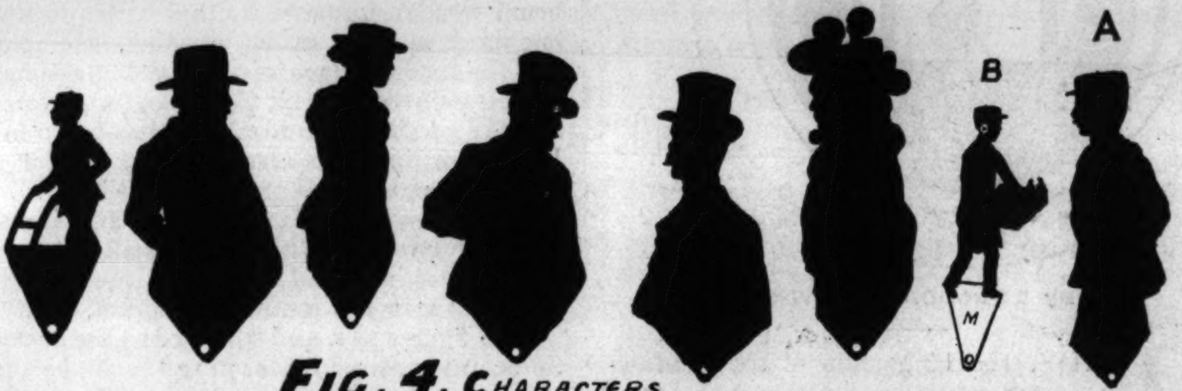


FIG. 4. CHARACTERS

The figure will pass in front of the carriage window in quite a life-like manner.

When it has passed right through the framework this figure is taken off, another substituted and the glass then drawn back.

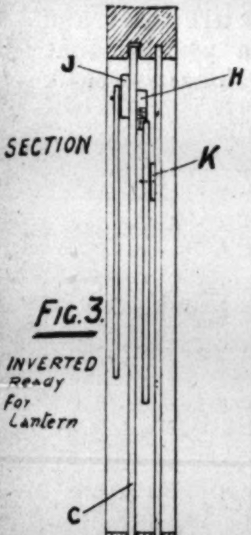


FIG. 3. INVERTED Ready for Lantern

Care must of course be exercised that the figures are so placed in position that they will be facing the right way when they are apparently walking along in front of the window, for it would rather spoil the effect to see a man walking backwards.

The operator will of course see to it that there is not a monotonous recurrence of the same figure, or a regular to and fro motion. He might at one time make three or four pass across the screen in one direction, and only one in the opposite. If it is desired to make a figure go in both directions, it is simply reversed on the pin.

A great variation may be introduced by using figures cut out of celluloid, and coloured with the paints supplied for lantern slides. It is, in fact, advisable to have such a variety of figures, as the effect is very pleasing. It will be understood that when such a figure as B (Fig. IV.) passes along, every part of his body will be seen as he is in the background. He must, therefore, be cut out of celluloid, and a piece left at the extreme end for hanging purposes. The figure itself will of course be blacked or coloured, the remaining part M being left clear.

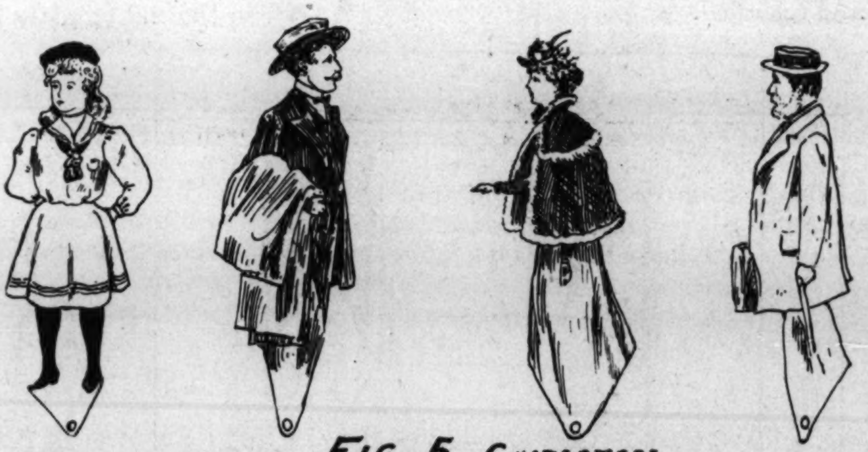


FIG. 5. CHARACTERS

I think I have said enough now to prove that this may be made a very effective slide.

As the sliding glass bearing the desired figure is slipped slowly through the framework, the block H coming in contact with the figures E and F will impart to them a slight swaying motion, and at the same time the audience will see a person walking by the window.

By the exercise of a little ingenuity, the operator can arrange his figures to please any and every audience that he may be called upon to entertain.

Some Points in regard to Oil Lamps.

The Oil and the Wick.

By GEORGE E. BROWN.

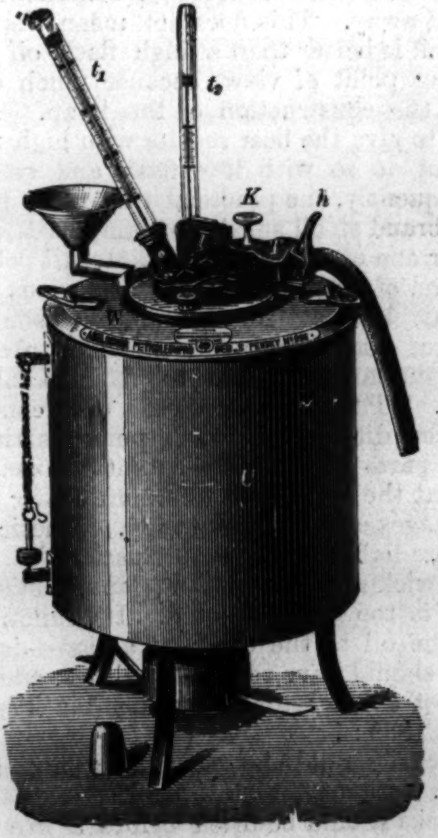
ALTHOUGH many lanternists still continue to use the oil lamp, there are probably many who have never considered it from a somewhat scientific point of view. Years ago Faraday delivered at the Royal Institution a series of lectures to children on the chemistry of a candle showing, in his own inimitable manner, the many questions of absorbing scientific interest bound up with the combustion of the humblest "dip." Much, in the same strain, could be said about the oil lamp, but I wish to refer only to those points which have practical lessons for the lanternist. Let us think for a moment what the production of a lamp flame involves.

In the first place, a flame is a vapour in an intensely hot condition. If it is a luminous flame, such as that of a candle or oil lamp, as distinguished from that of, say, alcohol, then this hot vapour contains either solid particles or else heavy vapours.

Some flames contain solid particles, whilst others owe their luminosity to incandescent dense vapour. Any way, the first thing to be achieved by a lamp is the production of a continuous supply of vapour, and the second a properly arranged supply of air to it, in quantity such that no unburnt vapour passes away, but yet in quantity insufficient to completely burn up the gas, *i.e.*, to burn it as coal gas is burnt in the Bunsen burner. An oil lamp is subject to the same chemical laws as a gas burner, with the difference that the vapour is supplied through the wick, and not directly as vapour.

It will thus be seen that there are two qualities of the oil which are very important from the point of view of its use in a lamp:—First, its thinness, with which the readiness or otherwise to rise in the wick is connected; and second, its—if we may coin a word—"vapourizability," upon which depends the readiness with which it gives off inflammable vapour.

In regard to the first of these properties, practically all petroleum burning oils are thin enough to be easily absorbed by the wick and transmitted to the place of combustion. The second property is measured by the point at which the oil commences to give off inflammable vapour—the so-called "flash-point."



The way in which this flash-point is ascertained is as follows:—The illustration shows the apparatus used as a standard means of testing in this and other countries. The instrument—Abel's tester—consists of an outer vessel of copper containing water, and an inner one in which the oil is placed. This is provided with a lid and sliding shutter, by drawing which across two small apertures in the lid are uncovered. Both inner and outer vessels are fitted with thermometers, and when a test is being made the outside vessel is filled with hot water, the oil placed in the inner cup, and allowed to gradually rise in temperature. As the thermometer reaches each separate degree the shutter is drawn across, and as this is done a small flame (either from gas or oil) is brought over one aperture. As soon as the oil reaches the temperature at which it commences to give off inflammable vapour a flash is seen inside the cup, being due to the explosion of a minute quantity of vapour with the air in the cup. This test, which can be made with very great delicacy, is often referred to as "Abel's close test."

It will therefore be seen that the lower the temperature at which an oil flashes, the more profusely it gives off vapour, which must be burnt, and the products of combustion conducted away. This does not mean that a low flash oil is better than a high flash oil from a lighting point of view, because much depends upon the construction of the lamp. A lamp made to give the best results with high flash oil will not do so with low flash, and *vice versa.* Consequently, the practical rule is to find out what brand of oil suits your lamp best, and use that or one of similar flash point. All petroleum oils are, of course, mixtures of various hydrocarbons, but at the same time some are mixtures the constituents of which are much more similar in regard to flash point than others. The objection to oils containing mixtures differing in flash point is that the lighter parts will to some extent be used first, and that the light will therefore suffer in the later stages of the consumption. American oils are more liable to this than Russian.

The wick is a part of the lanternist's outfit which is too often ignored. Its function—to bring the oil to the scene of action—demands that it should have several qualities, which we can best enumerate by quoting Sir Frederick Abel in 1885:—

"Wicks should be soft, and not tightly packed.

"Wicks should be dried before a fire before being used.

"Wicks should be only just long enough to reach to the bottom of the reservoir.

"Wicks should be so wide that they quite fill the wick-holder without having to be squeezed into it.

"Wicks should be soaked in oil before being used."

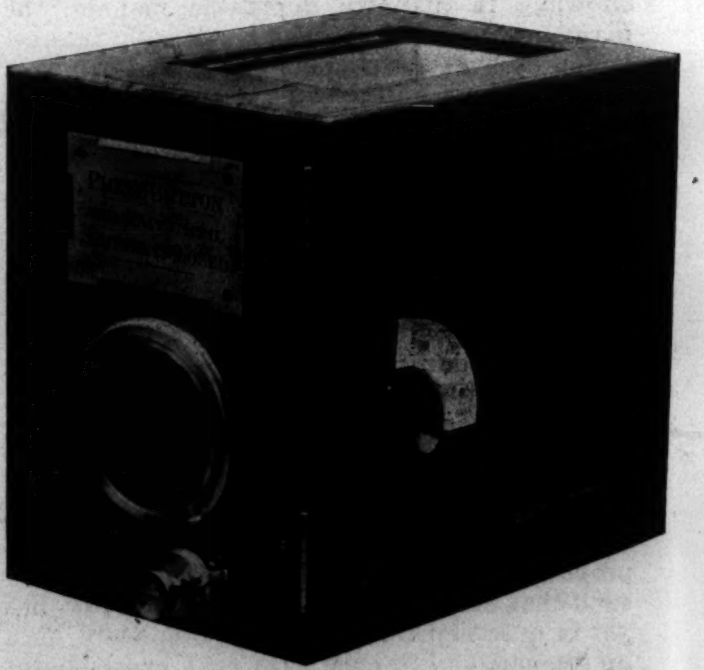
The smell of oil about a lamp is really the smell of oil, and not the smell of the burning. The products of combustion of a properly constructed lamp do not smell, and the objectionable odour which is to be noticed, even to a small extent after the most careful cleaning, is due to the access of oil to the outside of the lamp, from which it volatilises as the lamp gets warm, or to the imperfect combustion of the oil, due perhaps to the wicks being turned up too high. The best remedy for the first cause is to bake the empty lamp well, and fill it carefully with a funnel; or as some have found effectual, to let it burn itself right out after the exhibition.

[The block of the Abel's tester shown on previous page is kindly lent by Messrs. Baird and Tallock.]

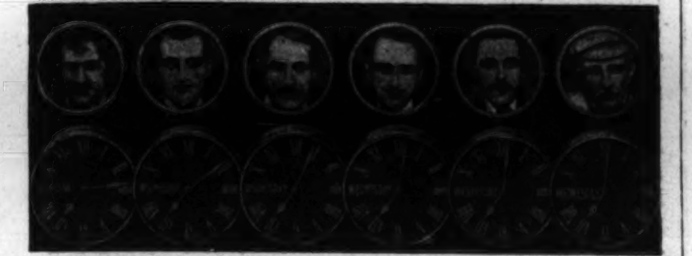
NEW APPARATUS.

THE GUV'NOR.

The Guv'nor is the name of a species of photographic camera introduced by Messrs. Withim & Co., of London, in order to definitely decide the times at which employees arrived. The illustration shows the instrument, which measures 10 by 7 by 7 inches. According to the light (artificial or otherwise), the index controlling the duration of required exposure is set. Each employee stands with his face close to the aperture and pushes the button below,



when an exposure is made on a film (after the style of a cinematograph film). Situated immediately above the aperture and inside the box is a clock, which is also photographed simultaneously with the employee. When making up time sheets, etc., the developed film supplies the necessary particulars. We are informed by the patentees that the special chemicals supplied by them greatly facilitate matters, and that by their use the records can be made ready for checking attendances by *an office boy in less than half-an-hour.*



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PATENT INTELLIGENCE.

The following List, relating to current Patent Applications, is compiled expressly for the "Optical Magic Lantern Journal" by W. P. Thompson & Co., Patent Agents, of 322, High Holborn, London, W.C., to whom all enquiries for further information should be addressed.

No. RECENT PATENT APPLICATIONS.

23217. 21st November, 1899. Oscar Messter. An improved apparatus for exhibiting or displaying a series of cinematographic or other pictures. Complete.

23484. 24th November, 1899. John Ebenezer Bousfield, of the firm of G. F. Redfern & Co. (Angelo Salmoiraghi, Italy). A new catadioptric projector.

23679. 28th November, 1899. George Hullingum. A new or improved method for photographing and exhibiting moving pictures.

23685. 28th November, 1899. Walter White. Improvements in apparatus for producing or exhibiting colour photographs.

23742. 28th November, 1899. David Abraham Lowthime. Improvements in magic lanterns and similar projecting apparatus.

23863. 30th November, 1899. William Norman Lascelles Davidson. Improvements in cinematographs for taking and projecting photographs in colours.

24039. 2nd December, 1899. William Britain, Junior. Improvements in apparatus for taking, projecting or inspecting series of photographs.

24549. 9th December, 1899. Charles de Vere and Carl Hertz. Optical device for changing costumes for theatrical purposes.

24551. 9th December, 1899. Charles de Vere. An improvement in the arrangement of mirrors and transparent glass for theatrical effects.

24557. 9th December, 1899. Alfred Pumphrey. Improvements in stereoscopes and in stereoscopic slides therefor.

SPECIFICATIONS ACCEPTED.

Copies of the following specifications may be obtained by remitting 1/- for each specification to W. P. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.

620 of 1899. Sandell. Sensitised continuous film for photographic and cinematographic purposes.

1382 of 1899. Sanson. Panoramas with animated views.

12511 of 1899. Abel (Soc. International d'Etudes Industrielles.) Means and apparatus for reproducing animated scenes by projection on to screens or surfaces.

17965 of 1899. Roebuck and McMillan. Combined kinematograph and magic lantern.

25110 of 1898. Debenham. Lenses for bi-focal spectacles.

2528 of 1899. Dönitz. Kinetoscopes and like apparatus.

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Correspondence.

VOTES OF THANKS.

To Mr. J. Hay Taylor, Editor.

SIR,—The letter of F. W. C. introduces questions of some interest. The old practice of voting thanks to the lecturer dies hard, but if his services are gratuitous, such is merely an act of the commonest courtesy. The same applies to the lanternist, but as long as he is the paid servant of either the society or the lecturer, such a proceeding is to my mind quite uncalled for. If not, why stop at the lanternist; why not proceed to vote thanks to the secretary, chairman, audience, hall-keeper, printer of the bills, and anyone else having a business connection with the evening's work? In this connection it may be noted that at a professional entertainment the lecturer usually thanks the audience in dismissing them, but at a lecture of the "institute" order the lecturer is thanked by the audience as often as not.

The fact is, all prefaces and additions to a lecture are a nuisance, and are too often utilised to kill time. The chairman worries the audience (who have probably been waiting some time) with his long-winded opening speech, and they are in consequence less favourably disposed towards the lecturer when he does get a start. The concluding proceedings spoil any good impression his efforts may have produced, and the audience leave the hall thinking the evening "flat, stale, and unprofitable."

Let a lecturer commence at the advertised time, get briskly on to his subject, deal with it as if he knew what he was talking about, wind up smartly, but not abruptly, and the audience, departing with his last words in their ears, will express enjoyment and surprise that the hour is so late. The old-fashioned formalities surrounding lectures are as much to blame as anything else for the great decline in lecture going, and the putting up of the shutters at so many institutes.

As to the "few shillings" to which F. W. C. refers, surely if the lanternist is so foolish as to accept less than a proper adequate fee, he has only himself to blame. Cannot lanternists see that if they would only stand together a little, they would soon become absolute masters of the situation?

In any given town, large or small, how many men are thoroughly capable of a first-class exhibition, and available at short notice for engagements which perhaps involves travelling 30 miles and staying over night?

Yours truly,
AN OPERATOR.

GAS CYLINDERS.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—There is an important question *re* above about which I should much like to see expressions of opinion and advice in your columns. Here is the case—say I pay a subscription to a firm for 500 or 1,000 feet of gas. I send my own cylinders to be filled. When the cylinders are returned to me, I always test them as early as possible after their arrival. Very often they register 3, 4 or 5 feet short of the capacity of the cylinders, yet I am charged for the full quantity. Suppose a 40 feet cylinder if filled 10 times and 4 feet short each time, you have just 40 feet, or in other words I lose just one filling of my cylinder. Someone may be ready to say that the fault is with my valve or gauge, and in reply I would explain that the gauge registers 120 atmospheres when the cylinder is full. I am determined not to pay for more gas than I have. And why should I? If a butcher charges for a pound more meat than you find he really supplies you would not pay him, why should I pay for more gas than I really have? When you have paid your subscription the firm can treat you as they choose, it seems. What is the remedy? What with cost of full cylinders home, and return of empties, together with price of gas, the expense is quite heavy enough now, without being charged for gas one never consumes. How often should cylinders be tested?

I am, yours truly,
CONSTANT READER.

—:o:—

Notes and Queries.

Ernest Elliott writes:—Can any brother lanternist tell me of anyone who is competent to take over a lot of effect slides and correct the registration? I am looking for someone who makes a trade of this kind of thing and charges fair prices for the work.

T.—If it is your intention to both give the lecture and work the bi-unial, you will find it necessary to be very familiar with the subject, as a good deal of it will have to be given without looking at the manuscript.

Rev. T. Perkins.—We thank you for the promise of a copy of your book "Wimborne Minster and Christchurch Priory" when published.

J. Jury asks:—Can limes be made by means of a tube with a serated or saw-like edge, or must the lime be turned in the ordinary manner on a lathe? *Ans.*—They can be made in the manner you suggest. Some years ago we knew of a person who fixed a tube such as you speak of as a bit in a drill stock and simply bored it as often as possible into a large piece of lime. He was a well-known exhibitor, and his exhibitions were always a success. We mention this because we quite expect letters in further reply to say that it is impossible to make limes in this manner, for some of the lime cylinder makers imagine that no one but themselves can possibly know anything about making limes for the lantern.

Robert Slater writes:—Can you kindly give me an explanation of what conjugate focus means, not with regard to any particular lens of a given focus, but of any lens? *Ans.*—The second part of your query is not very plain, but anyhow, if you get a copy of this Journal for December, 1892, from our publishers, you will find a special article devoted to this subject together with a working diagram. If you cut out this diagram and attach the arms by means of pins, you will gain more experience than you will by any amount of reading.

Theo. Cooper.—We note that no matter how much you "register" your slides, you cannot get the mats of all your cushion slides to appear so coincident as you wish, and that you want the opening of the mats when dissolving to be "dead steady." In order to do this you must make two mats (say) of zinc; these must be identical in size and fixed in front of the lantern condensers, and so registered, that when turning up one light and the other down it will appear as one. They must, of course, be a trifle smaller than your ordinary slide mats.

Retired Manufacturer writes a long letter in answer to that of Mr. Perry, which appeared in our October issue. We cannot publish the letter in full as no good would be done, but it goes on to explain that "Retired Manufacturer" endorses everything he said in our issue for September, but regrets that he is unable to produce for the benefit of Mr. Perry the signed agreements and contracts of others relative to the controlling of certain quarries by lime cylinder makers, also that when he gave the information spoken of, he did so with the intention of preventing intending lime cylinder makers who have not had actual experience in this business from falling into certain difficulties of which only those who have been engaged in the business can possibly know anything about.

A. H. Vidler.—You will find particulars of how to make an opaque foldable screen in our issue for December, 1897. That and other back numbers can be obtained from our publishers.

Inquisitive.—(1) Burning out the hydrogen cylinder should be left to Brins or other firms making a speciality of it. By burning out you will get rid of the deposit which often results from keeping house gas under pressure for any prolonged period, this it is which causes the discolouration of the limes. (2) We believe Mr. Walter Tyler, of Waterloo Road, makes contracts for large supplies about the price which you quote.

Rev. J. Thomas.—Your letter will have early consideration, but as it at present stands, it is simply an advertisement for the firm whose apparatus you so fully describe the working of.

F. G. Payne.—We cannot tell you where to get "a good price" for your old gas-bags. You can send them to Stevens's Auction Rooms, Covent Garden, and you will certainly get rid of them, but you will have to ignore the "good price" idea. There is practically no market for old gas-bags.

F. H. Rountud.—Your letter was sent on to Mr. Drew.